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ABSTRACT

The main objective of this research was to develop a suitable model for a Thai university library in information provision to tenant firms in the first Thai technology park. Such a model, which was based on Australian data, was fine-tuned to meet local Thai social and economic conditions. The research process investigated many issues with tenants in five Australian technology parks, including information needs, information use, information seeking behavior, information perception, librarian roles, and characteristics of required information services; the library information services that are already offered to tenant firms by Australian university libraries were also evaluated. The proposed Thai model encompassed five major library activities--policies, collection development, information services, staffing, and promotion and marketing. In Australia, there were three sub-sample groups taken into account: company staff members in five Australian technology parks; the technology park managers; and librarians in Australian university libraries that have formal links with the technology parks. In Thailand, the sample group for a preliminary testing of the proposed model comprised top management personnel of King Mongkut's University of Technology, whose technology park is in the process of establishment, and of three university libraries and one public library involved in information provision. The research methodology was structured interviews with checklist questionnaires. (Contains 15 references.) (MES)

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COLLABORATION BETWEEN A TECHNOLOGICAL UNIVERSITY LIBRARY AND TENANT FIRMS IN A TECHNOLOGY PARK IN THAILAND : NEW CHALLENGES FOR LIBRARIANSHIP IN A DEVELOPING COUNTRY *

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1. Background

There has been active collaboration between Thai universities of technology and industry since the national economic boom of the 1980s. In the main, such collaboration includes activities on a short and medium term basis, such as the university providing requested training, short courses and consultancies, and conducting research and development in some areas for the industrial sector. However, this collaboration has not as yet been formalised through the mechanism of science or technology parks.

The concept of setting up university-owned technology parks in Thailand emerged in 1988 following the Ministry of University Affairs' feasibility study about this matter subsequent to the incorporation of the science park development concept in the Sixth National Economic and Social Development Plan (1987-1991). [1] Foremost universities around the country were encouraged to propose technology park establishment projects to the government. A technology park establishment project ** proposed by King Mongkut's University of Technology Thonburi (KMUTT) *** was accepted in 1990 but the actual establishment of the park and other faculties commenced only in 1993 at its new campus. [2] Construction was expected to be completed this year (1998), but has been delayed since mid 1997, due to the national economic collapse and turmoil. [3] Currently two technology parks funded by the government are in the process of establishment in Thailand, one is university-owned (by KMUTT), the other, which is called Science Park, is being implemented by the National

Science and Technology Development Agency (NSTDA), Ministry of Science, Technology and the Environment. Even though Thailand is facing economic crisis, the two Parks still receive good support from the government because their establishment objectives are to assist SMEs. For example, through government incentives, the KMUTT's Technology Park would be able to provide Thai technical entrepreneurs who have limited finances with opportunities to start their business or develop pilot plants for industrial processes and products by giving assistance in premises, incubator units, equipment and technical information. [4]

2. What is a technology park?

There are various initiatives designed to stimulate university-industry collaboration, such as research park, science park and technology park. The generic term 'science park' usually refers to those initiatives [5]. While there are some distinctions between these terms, the three share major characteristics which are best described by the United Kingdom Science Park Association (UKSPA). The Association defined a science park as "a property-based initiative which [6]:

- has formal operational links with a University or other Higher Educational Institution, as major

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centre of research;
- is designed to encourage the formation and growth of knowledge based business and other organisations normally resident on site;
- has a management function which is actively engaged in the transfer of technology and business skill to the organisations on site.

The term Science Park may be used to include initiatives called by other names, eg. Research Park, Innovation Centre, High Technology Development, etc., where they meet the essential criteria set out above".

The distinctions between the three terms : research park, science park, and technology park are discussed by Dalton [7] and Grayson [8]. Research parks restrict their activities to pure research, development and prototyping whereas Science parks allow limited scale manufacturing along with research and development programmes. Technology parks, on the other hand, are normally designed to accommodate firms engaged in the commercial application of advanced technologies and some full scale production may be permitted.

3. Challenges to Thai Academic Librarians

When the KMUTT's project of setting up a technology park was approved by the Thai government in 1990, its university librarians were eager to get involved in university-industry collaboration. Unfortunately, we have no local experience because no Thai university library has ever been involved in the technology park business. At that time, we did not even understand what a technology park was; why the university would spend a lot of time and effort developing one; who would be housed there; and, what would they do. Additional major questions regarding library involvement in a technology park project continued to emerge, for example -was there any role for the library in such a collaboration? -what are the information needs and the information-seeking behaviour of tenant staff members? and -what kind of information services could be offered to them?

Answers to these questions could be obtained from literature searches overseas, collecting data mainly from developed countries. These, of course, would differ in circumstances from our own particular case as a developing country. Our university librarians realised that we needed guidelines to direct our involvement in such a collaboration which would be used not only by KMUTT library but also potentially by other Thai academic libraries. We considered that research on this particular topic should be undertaken somewhere we could gain not only the answers to those questions but also a place that had the potential to enhance our library and information technology experience. Australia, which is situated within the same region as Thailand, the Asia-Pacific, is advanced in high technology and also houses various kinds of university-industry initiatives, such as research parks and technology parks. Most importantly, the Australian government offers scholarships to Thai civil servants, selected by the Thai Government, who are working in various fields including the library profession, to come to Australia to continue their education. As a recipient of such a scholarship since 1994, I have undertaken a Ph.D. research which is entitled "A Model for a University Library which Provides Services to Tenant Companies in a Technology Park : the Australian Experience" at the Department of Information Studies, School of Social Sciences and Asian Languages, Curtin University of Technology, Perth, Western Australia.

The main objective of this research was to develop a suitable model for a Thai university library in information provision to tenant firms in the first Thai technology park. Such a model, which was based on Australian data, was fine-tuned to meet local Thai social and economic conditions. The research process investigated many issues with the tenants in five Australian technology parks. These included information needs, information use, information seeking-behaviour, information perception, librarians' roles, and characteristics of required information services, as well as evaluating the library information services which are already offered to the tenant firms by Australian university libraries.

The sample groups comprised both those in Australia and those in Thailand because it was considered to be very important that an investigation of the views of decision makers and librarians in Thailand was included in the research. It was not enough to impose Australian views and possibilities on Thailand,

therefore it was decided that a small sample of Thai participants would be tested on the developed model. In Australia, there were three sub sample groups taken into account: company staff members in five Australian Technology Parks; the Technology Park Managers; and University Librarians and/or certain librarians in Australian University Libraries which have formal links with the technology parks. In Thailand, the sample group for a preliminary testing of a proposed model comprised top management personnel of one university whose technology park is in the process of establishment, and of three university libraries and one public organisation involved in information provision. The research methodology was structured interviews with checklist questionnaires.

4. Findings from the thesis

4.1 Profiles of the interviewees

Thirty-nine staff members of thirty-six companies, accounting for 23.37% of the total firms (154 companies, as in 1996), in five Australian technology parks were interviewed between April 26, 1996 and 5 October 1996. The other two sample groups were : five Technology Park Managers and four University Librarians and/or librarians-in-charge in four Australian university libraries, also interviewed during the same time.

The companies visited were high-technology based ****; engaged mostly in software development, and communication and telecommunication areas. Most were small- and medium-sized businesses with employee numbers ranging from 2-320. Their main activities were a mixture of research and manufacturing, providing some products to either end users or other companies.

Staff educational backgrounds varied from secondary level to doctorate level. However, most of the staff members interviewed (84.61% or 33 out of 39 people) held university qualifications. They were either owners of their own companies or senior personnel with titles, such as Managing Director, Research and Development Manager, and Marketing Manager.

4.2 Information needs

Findings on information needs of the respondents confirmed results of previous studies [10, 11] that tenants need not only a variety of business information but also technical information from different sources. Reasons given for needing the information were technical purposes, commercial purposes, competitive purposes, maintaining the business , and remaining current. In addition, the type of information mostly needed is how-to-do-it practical material rather than purely theoretical issues. Formal information obtained from professional bodies was considered of great value as was informal information obtained from commercial and other informal sources.

4.3 Information-seeking behaviour

These findings also confirm results from previous studies that the preferred channel for communication among company staff members is informal personal contact. However, the research has indicated a real difference between information-seeking behaviour of those working in R&D area and those not involved in active research or development. The results reveal that information acquisition process of 76.92% of the company staff members who worked in non R&D areas was in favour of doing it themselves first, and then seeking advice from other people around them, such as colleagues and friends. In contrast, 23.08% of the interviewees which included all R&D people, preferred to ask somebody else within the company, including librarians, to actually seek out the required information. That is, they clearly prefer an intermediary to be involved in their information searches. For example one R&D Manager whose company did not have library facility or librarian gave a view of the disadvantages of seeking information himself that :

> *"We generally do it [search for information] ourselves and that is unfortunate , because we spend a lot of time trying to get on to the information, storing it and accessing it. So, that area could be improved.... you can use the librarians and it can make far better use of your time."*

Overall results showed that clearly, there is a great potential for librarians to step into the tenant firms' information acquisition process to assist people engaged in R&D areas, particularly for those who would prefer librarian assistance.

Interviewees' perception of physically going to the host library to search for information was that it was difficult and time-consuming. They therefore preferred to have electronic access to the library catalogues via their own computers as they believed such immediate access would save time and effort and at the same time they could still continue with their scheduled work.

4.4 Information sources

The thesis results indicate that in running their business staff members used various types of information from various sources, such as their own collections, direct sources generating information, and from the Internet. They also preferred to use information sources which are situated physically close to them. The results found that the staff members used the Internet heavily even though they questioned the quality of information they received from the Internet, as one respondent stated: "... we do use Internet for research although we don't find it incredibly reliable..." In addition, the respondents regarded the Internet as an important source of information because they believed that the Internet provides quick and convenient access, current information, as well as savings in information seeking costs. Information obtained from the Internet was used to keep themselves up-to-date, gain general ideas in some topics, and to test hypothesises. Such results revealed that the information they received from the Internet was basic type of information that fulfils curiosity about Who Does What and When type questions. In contrast, in-depth and complex high quality information written by persons knowledgeable in those fields, and needed by R&D staff members is not taken from the Internet. As one respondent gave the view:

> *"... The Internet only gives the basic information either from companies or from databases, but in isolation. It's probably not enough and needs to be backed up by reference to local conditions, or people knowledgable about the subject as well..."*

Such high quality information is available in a library or companies' own information collections, providing that they had them. However, the thesis results indicated that half of the companies visited, particularly the smaller companies, did not have sufficient and well organised information collections to serve their information needs. Given such circumstances, the library definitely has a critical role to play in providing information services to the tenant firms.

4.5 Intermediary role

The results confirm that most of the company staff members (70%) do need help in finding required information in libraries, as they expected librarians to know where to get what information was available in the libraries. Responses also indicated that some interviewees did not need librarians as intermediaries on a regular basis. Some stated that they needed librarians only at the beginning stage of using the libraries and when they became familiar with the library systems, they felt that they may no longer require assistance of librarians. Some needed help on special issues, for example in information technology available in the libraries. On the other hand, 30% of the respondents stated that they did not at all need librarians to act as intermediaries for finding required information, due to their own preferences in doing searches for required information themselves, and for security reasons.

The research results also indicated that the librarian's role as mere intermediary is not sufficient to meet clients' needs particularly with the widespread use of information technology. In fact, respondents felt that librarians should perform monitoring services as well, that is, the library should provide other services related to the Internet, such as lists of web pages by subjects, current information on what is changing in the Internet environment, in effect, whatever may affect their business activities.

4.6 Characteristics of required information services

The interview results revealed that traditional library services, such as physical library access, and borrowing services were considered of little usefulness. Instead, there was a need for services that can

present specific required information immediately. Additionally, respondents stipulated that content of the information was to be up-to-date and summarised before being presented to them. Electronic access to a library catalogue and other library services was recommended. Since not all the staff members knew how to search the Internet and use other information technology effectively, it was suggested that the library should provide training course on such topics, so that time and effort could be saved. In addition, courses on how to create web pages were also recommended, or even having web pages created for them (the clients).

4.7 Evaluation of the university libraries services

Of the five Australian Technology Parks visited, only three Technology Parks had formal links with universities. The thesis findings revealed that 80.76% of the interviewees were aware of library services available to them as one of many services offered by host universities via university-industry collaboration. Of the 80.76%, 47.61% had been informed of this through the Technology Parks, whereas only 9.52% stated that they knew about library services from the libraries themselves. Even though they were aware of such services, they were not aware of the full range of available services, in terms of, for example, what the services provided, what value they could receive from the services, who to contact and how to access them. In fact , the percentage of respondents using the host university libraries was only 38.46% and included as a whole those engaged in R&D areas. The other 61.54% stated that they did not use the libraries at all.

The findings also revealed that the rate of library usage of tenant staff members was related to the proximity of the library to the technology park. In addition, another reason considered by all R&D Managers for using the libraries was that the libraries had extensive collections with high quality information at low cost, the latter of particular interest for SMEs. On the other hand, three main reasons were given by the interviewees for not using the university libraries: firstly, going to libraries was inconvenient and time consuming; secondly, unavailability of relevant required information; and thirdly, there was no need for a library because all the information was made available to them by other means, without going to the library. It is pertinent to note the working environments of all the respondents who stated that they did not use libraries. All of them (16) who stated that they did not use the libraries were engaged in areas other than R&D, such as marketing, commercial and production. In addition, 18.75 % of them had formal in-house library facilities with their own librarians and 6.25 % had substantial in-house collections and also formally assigned one staff member to maintain those collections. The other 12.5% had parent and/or partner companies to fulfil their information needs without going elsewhere such as the libraries.

Responses from the interviewees also indicated that library awareness determines library usage. Responses from four out of five staff members who stated that they were not aware of any information services indicated that they did not use the library either. The thesis results also clearly show that business people were not fully aware of information services provided by host university libraries. It is therefore clear that the library should do more and better public relations on a regular basis, and the best channel recommended is via personal contact, follow by electronic. Relevant details of each service should be presented so that the businesses know what services are available, how they can be used to enhance their activities, who to contact, and the cost involved.

Experience from the Australian data pointed out many fundamental issues concerning library circumstances which could contribute to efficient information services being offered to tenants in a technology park. Consequently, before proposing a model for an academic library-technology park collaboration in Thailand, Thai university libraries circumstances were researched.

5. Circumstances of University Libraries in Thailand

(See also Diagram 1)

5.1 Current status of Thai academic libraries

Twenty four public university libraries around the country have already installed imported library

integrated systems, supported by the Ministry of University Affairs under its two library development projects, dated 1995-1997. The two projects, namely PULINET (Provincial University Library Network) and THAILINET (Thai Library Network), aim to provide support in developing automated library systems in each member library. The second phase of this project which is due to be implemented from 1999 to 2001, will merge the two projects and form Thai Library Integrated System (Thai LIS). Thai LIS aims to develop a union catalogue among Thai university libraries, as well as develop full text and image databases of Thai research reports, theses and universities' archives [12]. In short, by the end of 2001, we are aiming to have a union catalogue which initially covers catalogues of the twenty-four university libraries.

5.2 Internet access

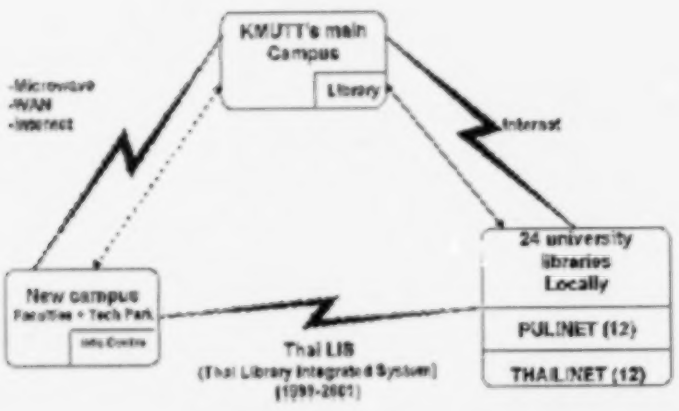
Information technology, including Internet facilities, has been booming in Thailand since the government declaration of 1995 as the national IT year, along with an approval of a national IT policy. As a consequence, a wide-range of national telecommunication infrastructure has been promoted and implemented. [13] Most organisations, either public or private, and including all of the twenty-four university libraries, have Internet access. Most of them have their own home pages in the WWW, and also provide access to their library catalogues via the web.

5.3 Resource sharing

Library resource sharing was formally initiated in Thailand when university libraries made an agreement for such needs in the 1970s, and following this agreement, bibliographic tools were developed manually, such as union catalogues and a union list of serials. Electronic library networking based on the resource sharing concept was introduced to a few Thai university libraries in the early 1990s and became widespread to cover many university libraries when Technical Information Access Centre (TIAC) was launched by the government in 1992. This centre has incorporated several inhouse databases, (which are mainly of a bibliographic type, developed by university libraries), into their host computer and provides on line access to its consortiums via Thaipak (a Thai packet switching network) and telephone lines. [14] As a consequence of Thailand's economic crisis budget cuts, including those of libraries, the resource sharing concept is being considered seriously (as against previously theoretically) by university libraries' executives. In order to manage the resource sharing exercise effectively, alliance libraries, sharing the same objectives and goals, need to establish policies, work procedures, and agreements which would bring mutual benefits. Effective resources sharing is one way to encourage Thai librarians to work closely and contribute to the promotion of creating the partnership concept as proposed in the model.

How KMUTT's library communicates with the new campus and other academic libraries is presented in Diagram 1. The infrastructure shows the potential of Thai academic libraries in offering electronic access for their clients, as proposed in the model.

Diagram 1 : KMUTT Library and Thai university libraries' current and future circumstances



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legends ———— current

--------- future

The process of developing an appropriate model for a Thai university library, based on Australian research data, required taking into account Thai university library circumstances, Thai economic, social and cultural conditions. To that end, the model was preliminarily tested on a small relevant sample group in Thailand and their comments and recommendations on the Australian practice as against what is appropriate or suitable for Thailand, are discussed below.

6. Australian practice and fine-tuning to meet Thai conditions

6.1 Library approaches and its location

Library facilities as well as other facilities of the host Australian universities were made available to all tenant firms of technology parks as incentives for Park occupancy. However, of the five Australian Technology Parks visited, only one is owned by a university and that Park is situated in the main, big campus, along with other university faculties. The campus library serves both its staff and students as well as tenant firms of the park. The other four technology parks, on the other hand, were not university-owned, but two have formal links with nearby universities. However, there is no branch or any other sort of library from the host university libraries physically situated on-site to provide services exclusively to tenant firms on the two technology parks.

In the case of Thailand, the university-owned technology park is in the process of establishment along with other faculties at the new KMUTT campus, which is about seventeen kilometres from the main campus. Obviously, the new campus needs its own library to serve clients on the campus. Consequently, the new library should be established as a new campus branch library of the university library. Such a branch library would be called an Information Centre in order to shift Thai clients' negative perceptions of a conservative library stereotype, that is, considering that a library is too old fashioned for innovative clients and entrepreneurs.

6.2 Library policy with tenant staff members

The thesis results indicated that tenants of the three Australian Technology Parks were not regarded as prime user groups of the host university libraries, therefore their rights and privileges in receiving library services were not the same as those of the university staff and students. The Technology Park tenants were regarded and treated the same way as other external corporate or community members. This may be a contributing reason for their little use of the library facilities. In the case of KMUTT, Thailand, its tenants in the first Thai Technology Park would be fully supported by the government incentives in various ways so as to enable them to concentrate on their work so that they could start new businesses. Additionally, such supports would be marketing tools to attract more businesses to move on to the Park. Since information is crucial in doing their work, tenants' rights and privileges in using the library facilities, unlike those in Australia, would be the same as those of the university staff members and students, encouraging them to use more library facilities and services. Such policy would be included in written form along with other library policies.

6.3 Library alliances

The Australian results revealed that of the three university libraries' information provision to tenants in the technology parks and other corporate members, there was only one library that had formerly had a formalised alliance with other libraries in providing such services, but had ceased because of insufficient budget. Apart from that, there was no evidence in the Australian results to show there was any formalised effort to join with other libraries in providing better services to this groups of clients in the technology parks. In Thailand, where budget, resources and manpower are limited, creating partnerships and sharing available resources with other libraries would be assumed as a prime library policy. We believe that such activities would alleviate these problems to some extent, and at the same time, encouraging each alliance to work more closely and give assistance to the ones in need, which would in turn contribute to improving and enhancing library activities.

6.4 Collection development

In the three Australian university libraries, their collections are shaped solely by their universities' curriculum. Library collections comprise various kinds of both printed and non-printed materials to serve their academic environment. Additionally, all libraries are fully computerised and equipped with efficient electronic network and telecommunication facilities. Electronic access to library materials and services are available to their staff members and students both via the OPAC and WWW. However, according to the respondents of the thesis research, the university libraries were considered to be full of materials on theory but lacking practical and how-to-do-it information. Also they felt information on business-related issues, such as company information, market and marketing information, and price list of certain products were not found in the university libraries. In Thailand, collections of the Information Centre should therefore include not only technical-related but also business-related issues as well as 'how-to-do-it' matters, shaped not only by the university curriculum, but by tenant companies' main activities. Tenants would be allowed to recommend library materials and other services they required.

6.5 Fee-based services

The thesis revealed that all the three Australian University libraries with formal links with the three Technology Parks, offered various kinds of services to the tenants, both free-of-charge and fee-based ones. Charging for the services included not only actual cost for the services but also library staff time, which increases the cost. The cost structure for the tenants is at the same rate as those of other corporate members. No subsidies were provided by the universities in the information searches. Thus the results indicated that high cost in information searches was a contentious issue for some companies, particularly SMEs, in making use of the services

In the case of Thailand, Technology Park establishment is a government mechanism to assist SMEs in creating home-based technology. Consequently, some cost for library value-added services would be subsidised by the government through the university. We believe that this would encourage the tenants to use more information to enhance their business activities. The fee structure is based on the potential for payment by the clients, by considering whether or not the tenants were start-up business or R&D sections of big companies.

6.6 Staffing

Australian experience indicated that certain qualified librarians could provide better services to the business community. Such librarians should have background knowledge on both technical and business-related issues as well as being computer literate. In addition, they should be service-minded, have good communication skills and out-going personalities as well as commitment to providing such services. In Thailand, however, it is very difficult to find those sorts of qualifications and personality in a single librarian at the moment. Particularly lacking at present are those with technical and business background knowledge, since nearly all of the Thai librarians have an arts/humanities background. Additionally, their service-mindedness, client-focus, out-going personality as well as computer-literacy are also not easy to develop due to both personal and Thai cultural reasons, particularly in the case of senior personnel. Thus, these areas need to be seriously emphasised and promoted in our personnel development programmes as well as library studies curriculum.

7. A proposed model for the KMUTT library in the provision of information services to tenants in its university-owned technology park

(See also Diagram 2)

Experience from my research and previous relevant studies overseas indicate that a university library has a critical role to play in information provision to tenants in a technology park. There are definitely information needs which cannot be satisfied through the Internet in its present form, particularly in the R&D area which is of particular importance to Thailand. How such information services could be implemented in Thailand was researched and fine tuned to coincide specifically to Thai conditions and

circumstances as discussed in 6.1 to 6.6. Presented below is the model for five major library activities, namely, policies, collection development, information services, staffing, and promotion and marketing.

7.1 Library policies and approaches

7.1.1 A new branch library should be established as a campus library which serves not only its staff members and students but also tenants of the Park. A physical presence on the park is vital to facilitate the provision of services and personal contact which is the major communication channel among the business community. The branch library should also be included as part of the technology park's infrastructure. Such a library would be called an Information Centre in order to shift clients' perceptions from the conservative library stereotype. In effect, service quality concepts should be adapted and incorporate into the Centre's policy, such as the concept of libraries being in competitive business and providing whatever it is expected by customers. [15]

7.1.2 The Information Centre should have some degree of autonomy between itself and the main library so as to enable the Centre to provide more effective services to its potential clients. Additionally, the Centre should focus on provision of services rather than collection management and technical services.

7.1.3 As it is clearly impossible for one library to house every kind of information, it is recommended that the university library should seek cooperation with other libraries, either university or special libraries, both locally and abroad, which house relevant information. Such collaboration should bring about mutual benefits. Resource sharing through collection development, interlibrary loan and document delivery should be put into practice rather than on paper.

7.1.4 The information centre should be electronically based with high quality and speed of services, equipped with electronic network and communication facilities to other buildings within and outside the campus. It should also perform as a gateway of the campus to access to other information sources both locally and internationally.

7.1.5 Since information provision to tenants in a technology park is quite new in the Thai academic library environment, the Centre should carry out appraisal processes on a regular basis in order to fine-tune its performances. The outcome of such activities should be appropriate action taken, with clients being informed of any changes.

7.2 Collection Development

Its collections should include not only technical-related but also business-related issues as well as 'how-to-do-it' matters shaped by both university curriculum and tenant companies' main activities. Information in electronic format rather than printed format should be emphasised to meet changes in information-seeking behaviour pattern of the clients.

7.3 Information services

Information services proposed to the target clients should include current awareness, document delivery, on line searching and training services as well as basic types of library services, such as library access and quick reference services. The value-added services would be charged at a minimum rate with some subsidies from the parent university so as to encourage the tenants to use more information in their business. The fee structure should be based on the potential for payment of the clients.

7.4 Staffing

Staffing in the proposed information centre is to include at least one professionally qualified librarian, with up-to-date business awareness as well as client-focus, to take full responsibility in providing such services to the tenants. He/She should have background knowledge on both technical-and business-related areas as well as be computer literate. In addition, the librarian should have good

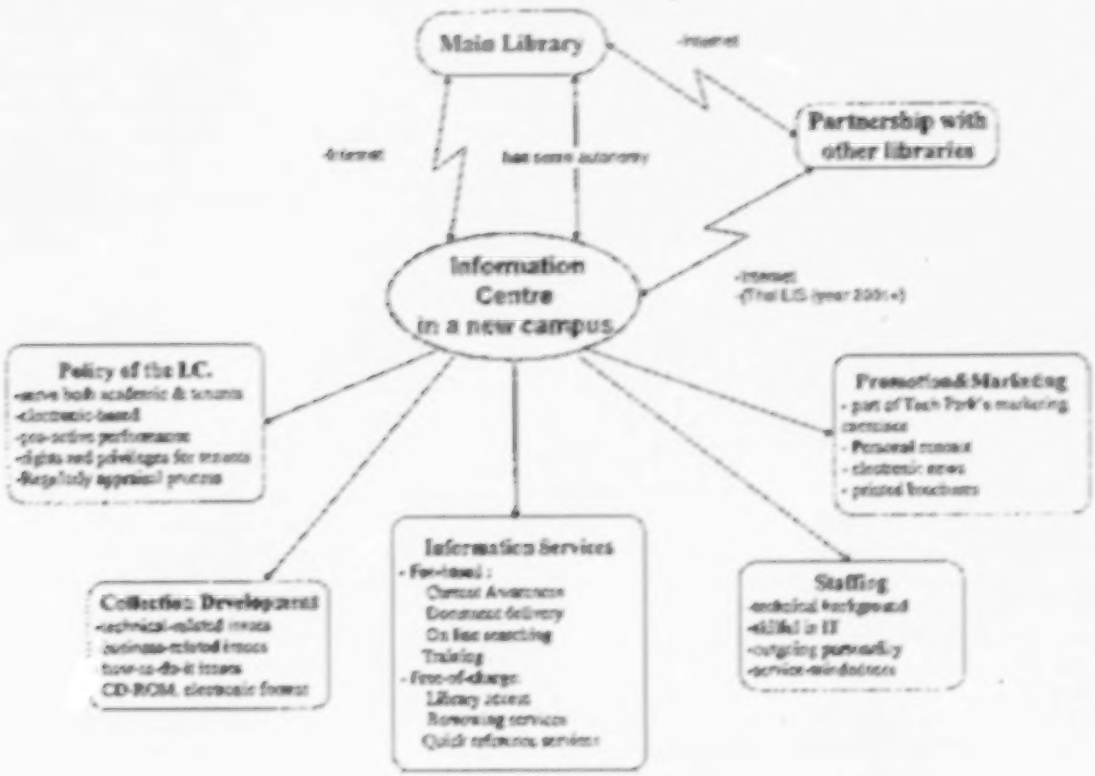
communication skills and an outgoing personality as well as commitment and motivation in providing such services.

7.5 Promotion and marketing

Promotion and marketing exercises of the centre should be undertaken seriously because library awareness determines usage. Such exercises should be incorporated in the activities of the university and the technology park. Additionally, the centre should also do its own promotion to inform the clients as to what services the centre would provide, what value the clients can get from those services, whom to contact in the Centre and how, and the costs involved. The best way to promote the centre is via personal contact and electronically, which should be carried out on a regular basis. Moreover, the centre should keep the clients informed of what is happening in the information centre either by e-mail facility or other publicity materials, such as pamphlets and brochures.

All recommendations are also presented in Diagram 2 :

Diagram 2 : A Proposed model for a university library in Thailand



8. Conclusion

The library activities outlined above present new endeavours for us as Thai university librarians to step beyond traditional library boundaries. The proposed model provides substantial guidelines for librarians to direct library involvement with group of dynamic clients. It is clear that libraries and librarians can form part of the many critical mechanisms that support national industrial development by providing relevant information to meet clients' needs. We have an exciting journey to make and challenges to overcome on the way. Whether and how effectively we arrive at the desired destination depends on our motivation, energy, positive attitudes towards the library profession, and willingness to adapt to our rapidly changing world. To conclude this paper, I would like to quote I.G. Dalton [16], Director of

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Heriot-Watt University Research Park who, at the International Association of Science Parks Asia-Pacific Regional Meeting in Bangkok in 1993, stated that:

> *"... it is people and their knowledge which contribute to the wealth of a nation, and mechanisms which help to create and share that knowledge base must be of value in any economy, whether regional or national."*

Notes

*) Since this paper is based on my Ph.D thesis, the term technology park is used throughout the paper

**) The initial project was called Industrial Park.

***) The former name of this university prior to 7th March 1998 was "King Mongkut's Institute of Technology

****) According to Baruch 9, high technology organisations (HTOs) are companies which have **1)** the existence of internal research and development as a significant share of the organisational operations. **2)** A mix of human resources (high proportion of academic and professional staff) as part of the organisation's employees. **3)** Area of activity is advanced technology, on the cutting edge of technology development. It is widely agreed that leading technologies are in the fields of micro-electronics, biotechnology, artificial intelligence, electronics, computers, pharmaceuticals, alternative energy, advanced weapon system, IT enterprise , software, etc.Thonburi (KMITT)"

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